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A checklist of African myxomycetes

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Abstract — A comprehensive checklist of the species of myxomycetes known from Africa does not exist, and the reported records are found in various sources scattered throughout the literature. In the study described herein, an effort was made to compile all known records of African myxomycetes from published articles, reports and databases. Our initial findings indicate that there are 294 species representing 49 genera reported from or known to occur in Africa. Of the 58 countries and territories on the entire continent, no records of myxomycetes apparently exist for 27 countries. A complete annotated species list is provided at http://www.mycotaxon.com/africamyxomycetes2.

Key words — mycetozoans, slime molds, distribution, taxonomy

Introduction

Information on African myxomycetes is scattered in various articles, reports and databases, which in most cases have a limited distribution. The first published checklist of African myxomycetes (Duthie 1917) included 108 species belonging to 26 genera. Over the past 90 years, several surveys for myxomycetes have been carried out in several African countries and territories. For example, such surveys have yielded regional species lists in North Africa (Faurel et al. 1966) and Mediterranean countries (Lado 1994). In other regions, surveys and collections of myxomycetes have contributed to the development of species lists in some countries including Tanzania (Ukkola 1998), Kenya (Ndiritu GG unpubl. data), Malawi and Zambia (Rammeloo & Mitchell 1994), Seychelles and Madagascar (Ing & Hnatiuk 1981), Mozambique (Almeida 1974b), Angola (Almeida 1974a), South Africa (Doidge 1950, Winsett KE unpubl. data), Gambia (Härkönen 1981), Liberia (Farr 1959), Nigeria (Ing & McHugh 1968) and Sierra Leone (Yamamoto et al. 1996). The idea of compiling this checklist was driven by the need to have an online updatable checklist of African myxomycetes and, by extension, allowing one to determine species occurrence in Africa.

Study methods

Records of myxomycetes were sought for 58 countries and territories in Africa. Countries were classified into five major regions primarily following present geo-political boundaries, although some modifications were made to reflect the African climatic regionalization (Goudie 1999). The five geo-political and eco-climatic regions are North, East, South, Central and West Africa. Additionally, the myxomycete species list of the Canary Islands was analyzed herein for comparison purposes. The taxonomic names used follow the nomenclature criteria proposed by Hernández-Crespo & Lado (2005) and only accepted taxonomic names were used. The total number of species reported from each country was calculated. Lastly, numbers of genera and species were compiled for each of the five regions.

Results

An examination of all known and currently available records indicates that myxomycetes have been reported from only 31 of 58 countries and territories in Africa. Overall, 294 species representing 49 genera were compiled from 31 countries. Only three countries had more than 100 species. These were Tanzania with 133 species (or 45% of all species known from Africa), Morocco with 123 species (42%) and South Africa with 107 species (36%). Interestingly, the relatively small Canary Islands, where more intensive surveys have been carried out, had 121 species. Other countries where moderate numbers of species have been reported include Algeria (79, 27% of all species), Nigeria (77, 26%), Angola (72, 24%), Kenya (70, 24%), Seychelles (56, 19%), Liberia (52, 18%) and Malawi (47, 16%).

Data for the occurrence of a species in a country or territory show that most species have rarely been encountered in the records of study in Africa, with 117 (40% of all species) and 48 (16%) species found in only one country or two countries, respectively. Twenty eight species were regarded as frequent (recorded in 10 to 19 countries), 57 species as common (occurring in five to nine countries) and another 43 species can be considered as occasional (found in three to four countries). An assessment of the numbers of genera and species found in Africa indicates that *Physarum,* with a total of 59 species, was the most dominant genus, followed by *Didymium* (24), *Diderma* (21), *Arcyria* (19), *Licea* (15), *Cribraria* (13), *Badhamia* (12) and *Trichia* with 11 species. Although the numbers of records in the five regions varied, the taxonomic composition with respect to genera and species was similar. Numbers of records obtained from countries in Central Africa were too low to allow meaningful comparison with other regions.

Discussion

A total of 294 species representing 49 genera, found in roughly 68 sources, are reported from Africa. This corresponds to only about 33% of the myxomycetes

(ca. 880 species) known world wide. The low number of species reported from Africa and its territories can be attributed largely to few surveys and inadequately skilled local taxonomists. The infancy of myxomycete knowledge in Africa is consistent with the fact that no myxomycete records exist for 27 countries. Substantial myxomycete records are found in only Tanzania (Ukkola 1998) and Morocco (Malençon & Bertault 1969), where extensive surveys have been undertaken. As might be predicted, myxomycete records in these two countries are comparable to the 121 species known for the much smaller Canary Islands, where several intensive surveys have been done (Beltrán et al. 2004). Moreover, the 17 species reported in the Canary Islands have not yet been reported from the Africa continent. In general, myxomycete species richness in the African continent is expected to be moderate to high, particularly if one considers its overall size and the presence of large biomes ranging from tropical forests to deserts, grasslands and Mediterranean woodlands.

The observed distribution and occurrence of myxomycetes at the level of genera and order were to a large degree comparable with the data obtained from other regions and countries worldwide (http://www.discoverlife.org/). All of the 23 most abundant species in Africa are also globally widespread and cosmopolitan. However, at the present time no serious conclusions can be made relating to the occurrence and distribution of African myxomycetes using available data, which is inadequate.

Emerging methods to study myxomycetes recommend the use of both field collections and moisture chamber cultures as well as sampling all substrates and microhabitats with which myxomycetes are associated (Spiegel et al. 2004). The few studies that have attempted to use both methods in Africa and which have obtained promising results include those of Ukkola (1998) in Tanzania. Similarly, acceptable results were obtained with the moisture chamber culture technique (Härkönen 1981, Abdel-Raheem 2002). For the most part, results obtained using only field collections have been unsatisfactory (Farquharson & Lister 1916, Farr 1959, Kost 2002). Records used to compile this list were based primarily on field collections on ground litter. It is imperative that future studies in Africa take into consideration the richness of other substrates, for example the value of aerial litter in tropical habitats (Schnittler et al. 2002, Ndiritu unpubl.) and anthropogenic ecosystems (e.g. Tran et al. 2008).

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